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tion. First there are the results which may not have proved valuable to the laboratory in which they were obtained, but which would be of immense value to some one else working in an entirely different field. Second, there are those results of value to the laboratory possessing them, but which could be published in an unapplied or "pure" form and which would make an important contribution to science and at the same time the publication would work no injury to the company or corporation most interested. And finally there are those results of operations and processes, machines and apparatus, which, if the truth were known, are possessed by a large number of concerns, but are held as valuable secrets by each. Every one would profit and no one be the loser by so far-sighted and generous a policy. Germany is very justly held up before us as a shining example of marvelous industrial progress and prosperity. A very great deal of the credit for her present position is due to her splendid educational system. But no small factor in her national progress is the helpful attitude which her industrial organizations take toward the publication of scientific data. The individual does not suffer, while Germany both from a purely scientific and an industrial standpoint is rapidly advanced. But too often with us the president and his board of directors are alchemists; they fail to see why, if they pay the salaries of their research men, they should give to the public, or their competitors, any part of their results. They exclaim "what has posterity done for us?" They would have their laboratories remain the secret chambers of the alchemists, and continue to improve their methods of changing baser materials into gold without regard to the obligations which they owe to their fellows.

It requires no extensive mathematical

calculation to prove that the manufacturers themselves would be the ones to profit by such a liberal treatment of the results of scientific work. Of one hundred manufacturing concerns each one would give but one per cent. of the whole contribution, while he would receive the remaining ninety-nine per cent. He could not in the long run be the loser. But of vastly more importance, he would feel and know that his organization was taking part in a world movement toward that increase of human knowledge upon which all real progress depends. Why become selfish and sordid so soon as one's scientific work becomes of immediate value to one's fellows? The greater sense of satisfaction, the greater success even of an industrial organization, lies in a fuller, freer, more generous publicity of the scientific results of their laboratories. Would that each such industry might benefit by the experience of Solomon, King of Israel, who, when asked, "What shall I give unto thee?" replied, "Give me knowledge and wisdom," and he was answered, "Wisdom and knowledge are granted unto thee; and I will give thee riches and wealth and honor."

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APPROPRIATIONS FOR THE DEPARTMENT OF AGRICULTURE¹

THE growth of the National Department of Agriculture during the past ten years has far exceeded that of all of its preceding history. This was pointed out by Hon. Charles F. Scott, chairman of the House Committee on Agriculture, in submitting the new agricultural appropriation bill last winter. Its growth as marked by a decade has been phenomenal, viewed either from the standpoint of its scope and authority, its material resources, or its personnel.

¹ From the *Experiment Station Record*, April, 1911.

As a full-fledged department with a cabinet minister at its head, the department dates only from 1889. But if we go back to 1839, when \$1,000 was appropriated for "agricultural statistics," and include every dollar appropriated out of the treasury of the United States for agricultural purposes down to and including the year 1900, the total sum is, as Mr. Scott pointed out, only \$45,102,616, while the aggregate of all the money appropriated from the end of 1900 to the end of the current fiscal year reaches a sum nearly double this, or \$90,012,058. For the fiscal year 1901 the appropriation for maintenance was \$3,304,265.97. This year the department has at its disposal \$15,470,634.16. "Ten years ago the total number of persons employed in the department was 3,388; this year if all the rolls were called an army of 12,480 men and women would respond."

Under the bill which the committee submitted, and which after considerable discussion and amendment received the signature of President Taft March 4, provision is made for an even greater development during the ensuing year. The aggregate amount carried by the act is \$16,900,016, which by far exceeds that granted in any previous measure, and is \$887,950 in excess of the estimate submitted by the department.

There is an apparent increase over the appropriation act for 1911 of \$3,412,380, but of this \$720,000 is only nominal, since it merely replaces what has hitherto been provided automatically as a permanent appropriation to the state experiment stations under the Adams Act. It will be recalled that by the terms of that act as subsequently construed in the appropriation act for 1907, definite appropriations were made only until July 1, 1911. The action taken by congress now provides for the continuance of the Adams Fund on the same basis as the Hatch Fund, requiring the amounts to be appropriated annually in the agricultural bill. With due allowance for this item, however, there is still an actual enlargement of the appropriations of every bureau, and a net increase of fully 20 per cent. for the department as a whole.

In general the increased appropriations are for the purpose of extending and developing lines of work already under way rather than the undertaking of new projects, and some of the principal increases are for what may be termed the administrative activities of the department. One of the largest new items is an appropriation of \$1,000,000 for fighting and preventing forest fires in the national forests in cases of extraordinary emergency. This appropriation is in addition to the regular appropriation of \$150,000 for fire fighting under ordinary conditions, and supplements deficiency appropriations of over \$900,000 incurred as a result of the disastrous fires of last summer.

The federal meat inspection, which has been enforced by the department from a permanent annual appropriation of \$3,000,000, receives an indirect increase of \$155,000 through the transfer of its clerical force to the statutory roll of the Bureau of Animal Industry. The Bureau of Chemistry receives \$60,000 additional for the enforcement of the Food and Drugs Act, and the Weather Bureau \$75,490 additional for its weather service. Provision is also made by an appropriation of \$87,000 for the enforcement of the Insecticide Act, which became effective January 1, 1911, and for which a deficiency appropriation of \$35,000 had been allowed for expenses to July 1.

A number of propositions involving general legislation were considered in connection with the bill, but as finally enacted the law remains substantially a routine measure. The secretary was again authorized to continue investigations on the cost of food supplies at the farm and to the consumer; and a special appropriation of \$5,000 was added for a study of chestnut bark disease.

Comparison of the allotments to the various bureaus in this act and those preceding it is rendered difficult because their clerical employees will, in accordance with a clause inserted in the act of 1911, be transferred on July 1 from the various lump-fund appropriations on which a portion of them had been carried to the roll of positions specifically provided for. These transfers in certain cases—

as, for example, in this office and the Bureau of Statistics—involve but a few employees, but in the case of the Forest Service, where 1,894 forest rangers and similar employees are to be transferred, they occasion an apparent increase in the appropriations for statutory salaries from \$60,200 for the current year to \$2,318,680, with a corresponding deduction from lump-fund appropriations. The lump-fund appropriations, therefore, for a particular purpose, such as biological investigations or soil-survey work, no longer indicate so completely as they did previously the entire expenditures for these objects. Comparison is still possible, however, as regards the aggregate appropriations of the bureaus.

The Weather Bureau receives a total of \$1,600,250. Of this amount, \$15,000 is for the restoration of the Weather Bureau station at Key West, Florida, wrecked by hurricanes in October, 1910. The allotment for maintenance of the bureau printing-office was reduced to \$18,000 by reason of the recent transfer of a portion of the equipment to the Government Printing Office. For investigation of climatology and evaporation \$120,000 was provided, as at present.

The appropriations to the Bureau of Animal Industry aggregate \$1,654,750. Aside from the increase due to the transfers from the meat-inspection act, previously referred to, the chief additions are those of \$7,120 for the tick-eradication work, making that appropriation \$250,000; an increase of \$7,000 for the work of the Dairy Division, making its total \$150,000; and of \$7,640 for the Animal Husbandry Division, or \$47,480 for that work. Under a new clause inserted in the act, the Secretary of Agriculture is authorized to permit, under certain conditions, the admission of tick-infested cattle from Mexico into those portions of Texas below the quarantine line.

New appropriations were made of \$65,000 for the purchase of land for quarantine stations near Baltimore, Md., and Boston, Mass.; \$10,000 for equipping the 475-acre experiment farm which has recently been acquired at Beltsville, Md., and \$16,500 for constructing buildings at this farm and that at Bethesda,

Md. It is expected to utilize the Beltsville farm for the experimental work of the Animal Husbandry and Dairy Divisions, and to reserve that at Bethesda for pathological investigations.

One of the largest increases in the bill was accorded to the Bureau of Plant Industry, which will receive \$303,480 additional, making its total \$2,061,686. The lump-fund appropriation for general expenses is \$1,441,536, which is divided among thirty projects. Some of the largest of these are \$350,000 for the boll-weevil campaign (a net increase of \$106,945); methods of crop production in the semi-arid or dry-land sections, and for the utilization of lands reclaimed under the Reclamation Act, for which a net increase of \$38,270 and a total of \$143,060 is granted; \$142,920 for the farm management studies, of which \$4,000 is to be used in agricultural reconnaissance work in Alaska; studies of the production, handling, grading, and transportation of grains, for which \$135,005 is available, an increase of \$24,500; and the studies of fruit improvement and the methods of growing, packing and marketing fruits, which will have \$87,735. The investigations of the cotton industry were extended to include the ginning and wrapping of cotton.

For the purchase and distribution of valuable seeds and plants the allotment made was \$289,680. This is an apparent decrease of \$19,910, but it is accounted for in part by transfers of clerical employees to the statutory roll of the bureau, and in part by the segregation as a distinct project of \$20,000, which was formerly supported from this fund. The two items comprising this appropriation are the congressional seed distribution, which is continued on the usual basis, with \$237,160, and the allotment for the introduction of seeds and plants from foreign countries, which is increased to \$52,520.

The appropriations to the Forest Service reached a total of \$5,533,100, in addition to the various emergency appropriations to which reference has been made. This, as usual, represents the largest appropriation to any one bureau, and is also the largest increase

over the previous year, the total for 1911 having been \$5,008,100. The policy of definite allotments to each of the 161 national forests for maintenance was continued. The Nebraska National Forest was authorized to furnish young trees free of charge to settlers in the surrounding region.

The sum of \$150,000 was granted for fighting forest fires and for other unforeseen emergencies, of which \$70,000 is immediately available. The allotment for permanent improvements on the national forests was increased from \$275,000 to \$500,000. Provision was made for the refunding to claimants of moneys erroneously collected in the administration of the national forests, and for the granting of easements under certain conditions for rights of way across the public lands, national forests, and reservations, for the transmission of electrical power and for telephone and telegraph purposes.

Liberal provision for the development of investigational work was also made, \$177,040 being granted for investigations of methods for wood distillation and preservation and the economic use of forest products, including the testing of woods for paper-making, together with \$18,420 for investigations of range conditions within National Forests and range improvement, \$251,168 for silvicultural and dendrological experiments, and \$33,760 for miscellaneous forest investigations and the preparation and dissemination of results.

The appropriation of the Bureau of Soils was increased to \$262,060. No appropriation was made for soil erosion investigations, for which \$5,000 has been allotted annually for many years. The soil survey work received \$145,000, a net increase of \$13,040, with a provision added limiting to 10 per cent. the expenditures in any state.

The bureau was authorized to undertake a new line of work by the appropriation of \$12,500 "for exploration and investigation within the United States to determine a possible source of supply of potash, nitrates and other natural fertilizers," \$2,500 being made immediately available. It is expected that particular attention will be devoted to possible

sources of potash in view of the present situation as regards the German potash supply. The work will also be supplemented by researches to be conducted by the Geological Survey, which received authority in the sundry civil appropriation act to expend \$40,000 "for chemical and physical researches relating to the geology of the United States, including researches with a view of determining geological conditions favorable to the presence of potash salts." According to a recent announcement from the survey, the expenditure of half this appropriation for the potash exploration is contemplated.

The Bureau of Entomology receives an aggregate of \$601,920. This is an increase of \$69,740, mainly for the extension of work to the alfalfa weevil and for enlarging the investigations on insects affecting rice and sugar-cane, for demonstration work against forest insects, and for additional studies in bee culture. The largest single allotment is for the continuation of the campaign against the gipsy and brown-tail moths, for which the appropriation is \$284,840.

The large proportionate increase of \$52,780 was accorded the Bureau of Biological Survey, making its total \$139,700. All the various lines of work were continued on a more comprehensive basis, and new items were included of \$2,500 for the purchase, capture, and transportation of game for national reservations, and of \$20,000 for the feeding, protecting and removal of elk at Jackson's Hole, Wyo., and vicinity. The latter appropriation is made immediately available and remains available until expended.

The activities of the Office of Public Roads have been rapidly increasing in recent years, and to keep pace with the growing demands the appropriation was increased from \$114,240 to \$160,720. A new line of work authorized is the conducting of field experiments in road construction and maintenance, for which \$10,000 is granted.

The total appropriation of the Office of Experiment Stations is \$1,864,000, of which \$1,440,000 is allotted to the state experiment stations under the Hatch and Adams Acts.

Of the remainder, \$56,500 is for statutory salaries and \$37,500, a net increase of \$5,000, is for general expenses. The allotment of \$10,000 for the agricultural education service was continued as at present.

The nutrition investigations received an increase of \$5,000, making \$15,000 available for this purpose. This increase will enable further extension of these investigations and the preparation of popular bulletins setting forth plans for the more economical and effective utilization of agricultural products as human food, for which data a strong demand has been in evidence.

An estimate of \$20,000, submitted for the preparation, publication and dissemination of original technical reports of the scientific investigations of the experiment stations by the Secretary of Agriculture in cooperation with the Association of American Agricultural Colleges and Experiment Stations, was favorably recommended by both the house and senate committees, but failed of passage.

The Alaska, Hawaii and Porto Rico experiment stations were given \$30,000 each, an increase of \$2,000 in each case to equalize their funds with those received by the state stations from federal funds, and the Guam Station was continued at \$15,000. The clause requiring the expenditure of \$5,000 by the Porto Rico Station for coffee experiments was omitted, thereby restoring the coffee work to the same basis on which it has been conducted for many years previous to the passage of the act for 1911.

The irrigation and drainage investigations each received \$100,000, a net increase of \$32,820 and \$25,980, respectively. These increases will enable the extension of these lines of work, especially in the rendering of assistance to settlers in newly irrigated regions, and in formulating plans for the reclamation of swamp lands. The provision requiring a special report of the aggregate expenses in the drainage investigations to date and the areas in the several states and territories which have been investigated was continued.

The work of the remaining bureaus was provided for along substantially the present

lines. Including the increase previously noted for the enforcement of the Food and Drugs Act, the Bureau of Chemistry will receive \$68,080 more than at present, and a total of \$963,780. The Bureau of Statistics is given \$231,620; the Library, \$40,500; the Office of the Secretary, \$276,450; the Division of Accounts, \$97,520; the Division of Publications, \$209,960, and the fund for contingent expenses, \$110,000. These all contain small increases, occasioned in general by the growth of the department.

In addition to the sums carried in the appropriation act itself, there should also be considered the appropriation of \$470,000 for the department printing and binding, which appears in the appropriation act for sundry civil expenses. This represents a nominal increase of \$10,000, but \$22,000 more than at present is assigned to the Weather Bureau by reason of the transfer of a portion of its branch printing office, making a virtual decrease of \$12,000 for the remainder of the department. There is also to be added the permanent appropriation of \$3,000,000 for the meat-inspection work. Deficiency appropriations were granted, as well, of \$923,192.90 for the fighting of forest fires in 1910, the relief of employees of the department killed or injured in that campaign, and for horses and equipment destroyed during it, and \$35,000 for the enforcement of the Insecticide Act during 1911.

Additional funds which will be administered by the department are provided in the measure enacted at the recent session of congress for the protection of the watersheds of navigable streams, and popularly known as the "Appalachian Forest Reserve" Act. Under this act the secretary of agriculture may expend \$200,000, in cooperation with states requesting it, in the protection from fire of the forested watersheds of navigable streams, irrespective of ownership. He is further authorized to purchase, following a favorable report by the Geological Survey and the approval of a National Forest Reservation Commission, of which he is *ex-officio* a member, lands located at the headwaters of navigable streams,

and to administer these lands as permanent national forests. An appropriation of \$2,000,000 is made annually until July 1, 1915, for the examination and acquisition of these lands, together with \$25,000 additional annually for the expenses of the commission.

Eliminating the deficiency appropriations and that for the Forest Reservation Commission, these various appropriations, which are intimately connected with the work of the department, would, if added to the regular appropriations, make a grand total of \$22,570,016. This is a large sum, but as was pointed out by Chairman Scott in concluding the presentation of the bill, "the money appropriated for the Department of Agriculture is an investment and not an expense. And that it has been a good investment the statistics showing the expansion of agriculture and the improvement in methods throughout our country bear eloquent witness. During these past ten years, while the Department of Agriculture has been expending \$90,000,000, the farmers of the United States have added to the wealth of the world the stupendous and incomprehensible sum of \$80,000,000,000. Without anything like a corresponding increase in the area of land under cultivation, the value of the farm products of our country has risen from slightly more than \$4,000,000,000 ten years ago to nearly \$9,000,000,000 in 1910.

"The conclusion is inevitable, therefore—and that conclusion could be made incontestable by innumerable other proofs if time permitted—that the farmers of America are applying better methods and getting better results from their labors than ever before. And in devising these better methods, in pointing the way for better results, the Department of Agriculture has been the undisputed leader, as it should be, and has thus beyond cavil or question derived from the money it has expended a percentage of profit to all the people which can not be calculated."

**APPROPRIATIONS FROM THE BACHE
FUND OF THE NATIONAL ACADEMY
OF SCIENCES**

DURING the past year the following grants

have been made from the Bache Fund of the National Academy of Sciences:

May 20, 1910. Franz Boas	\$300
Investigation of head-forms of new-born children.	
May 20, 1910. John A. Parkhurst	500
Photometric and spectroscopic survey of circum-polar stars.	
June, 1910. Louis T. More	500
Continuation of investigation on discharge of electricity through gases; radioactivity and electro-magnetic action (second appropriation; first made in May, 1908).	
December 9, 1910. S. F. Acree	400
Investigation of reactions of alkyl halides with sodium ethylate.	
January 25, 1911. P. W. Bridgman	500
Effects of high pressure; variation of freezing point of liquids with pressure; compressibility of liquids and solids; and mechanical properties of metals.	
February 2, 1911. Francis B. Sumner	250
Experiments on effects of external conditions on growing white mice.	
April 17, 1911. E. W. Washburn	200
To prepare and measure the specific conductance of pure water.	
April 17, 1911. Gilbert N. Lewis	500
The determination of the electrode potentials of the alkali metals and of the metals of the alkaline earths.	
April 17, 1911. Charles C. Adams	125
For the expense of completing and preparing for publication a paper entitled "The Geographic Variations and Relations of CO."	

SCIENTIFIC NOTES AND NEWS

COLUMBIA UNIVERSITY has conferred its doctorate of laws on Professor C. F. Chandler, who retires this year from the chair of chemistry after forty-seven years of active service.

SIR WILLIAM T. THISTLETON-DYER, formerly director of the Kew Botanic Gardens, will receive the honorary doctorate of science from Oxford University on June 28.

DR. C. S. SARGENT, director of the Arnold Arboretum, Harvard University, has been elected an honorary member of the Société Nationale d'Acclimation de France, and an honorary member of the Royal Irish Academy.